obligation extends throughout its ubiquitous transport network, including ring transport architectures, we do not require incumbent LECs to construct new transport facilities to meet specific competitive LEC point-to-point demand requirements for facilities that the incumbent LEC has not deployed for its own use.

325. Dark Fiber. In addition, we modify the definition of dedicated transport to include dark fiber. Dark fiber is deployed, unlit fiber optic cable that connects two points within the incumbent LEC's network. As discussed above, dark or "unlit" fiber, unlike "lit" fiber, does not have electronics on either end of the dark fiber segment to energize it to transmit a telecommunications service.[641] Thus, dark fiber is fiber which has not been activated through connection to the electronics that "light" it and render it capable of carrying telecommunications services.[642] To provide additional capacity, new electronics are attached to previously "lit" fiber or to previously "dark" fiber. Because dark fiber is already installed and easily called into service, we find that it is similar to the unused capacity of other network elements, such as switches or "dead count" or "vacant" copper wire that is dormant until carriers put it in service.[643]

326. We agree with state commissions and competitive LECs that dark fiber meets the statutory definition of a network element, and therefore is included within the definition of the dedicated interoffice transport network element.[644] Section 153(29) of the Act defines the term "network element" as a "facility or equipment used in the provision of a telecommunications service, including "features, functions, and capabilities that are provided by means of such facility or equipment."[645] The Supreme Court upheld this broad definition of a network element and acknowledged that it includes not only

641 *See supra* Section (V)(A)(2).

642 Choice One Joint Comments at 25; CO Space Comments at 2; KMC Comments at 21.

643 *See, e.g.,* Petition for Arbitration of an Interconnection Agreement Between AT&T Communications of the Pacific Northwest, Inc. and GTE Northwest, Incorporated, Washington UTC Docket No. UT-960307, Commission Order Approving Interconnection Agreement, at 19-20 (1997) ("As a form of spare capacity, "dark" fiber is not fundamentally different than "dead" copper."). *See also* Comments of CO Space at 12, (citing a New Hampshire commission finding that "the fact that dark fiber is not currently used in the provision of service to customers for a fee does not distinguish itself from other network elements.") (citation omitted).

644 Illinois Commission Comments at 10; Iowa Comments at 9; GSA Comments at 7,10; Cable and Wireless Comments at 34; CO Space Comments at 7; Waller Creek Comments at 17; *See also* Texas Commission Comments at 16; KMC Comments at 21.

645 47 U.S.C. § 3(29) provides that: "The term 'network element' means a facility or equipment used in the provision of a telecommunications service. Such term also includes features, functions, and capabilities that are provided by means of such facility or equipment, including subscribers numbers, databases, signaling systems, and information sufficient for billing and collection or used in the transmission, routing, or other provision of a telecommunications service." 47 U.S.C. § 3(29). *See also, Local Competition First Report and Order,* 11 FCC Rcd at 15631, para. 258.

physical elements but non-physical elements as well.[646] Because dark fiber is unused transport capacity, we find that it is "a feature, function, and capability of facilities used to provide telecommunications services."[647] In addition, we note that since the Commission released its *Local Competition First Report and Order*, several states, acting through arbitration proceedings, have required incumbent LECs to unbundle dark fiber interoffice transport facilities, and several federal district courts, in affirming state commission decisions, have held that dark fiber meets the statutory definition of an unbundled network element.[648]

327. We reject incumbent LECs' arguments that because dark fiber is transport that is not currently "used" in the provision of a telecommunications service, within the meaning of section 153(29), it does not meet the statutory definition of a network element or the definition of interoffice transport.[649] Rather, we agree with the Illinois Commission that the term "used in the provision of telecommunications service" in section 153(29) refers to network facilities or equipment that is "customarily employed for the purpose" of providing a telecommunications service.[650] Although particular dark fiber facilities may not be "lit" they constitute network facilities dedicated for use in the provision of telecommunications service, as contemplated by the Act. Indeed, most other network elements have surplus capacity or can be upgraded to provide additional capacity and therefore are not always "currently used" as the term is interpreted by incumbent LECs. For example, switches, loops, and other network elements each may have spare, unused capacity, yet each meets the definition of a network element.[651]

328. We acknowledge that it would be problematic if some facilities that the incumbent LEC customarily uses to provide service were deemed to constitute network elements (*e.g.*, unused copper wire stored in a spool in a warehouse). Defining such facilities as network elements would read the "used in the provision" language of section 153(29) too broadly.[652] Dark fiber, however, is distinguishable from this situation in that

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646 *Iowa Utils. Bd.*, 119 S. Ct. at 731.

647 CO Space Comments at 3 (and cases cited therein).

648 *See* CO Space Reply Comments at 3 (and cases cited therein).

649 GTE Comments at 64, 80; US WEST Comments at 39-40; Bell Atlantic Reply Comments at 31.

650 *MCI Corp.: Petition for Arbitration Pursuant to Section 252(b) of the Telecomms. Act of 1996 to Establish an Interconnection Agreement with Central Tel. Co. of Ill.*, 96 AB-009, 1997 Ill. PUC LEXIS 61, at *7 (Feb. 5, 1997) (emphasis added).

651 *See, e.g.*, "As a form of spare capacity, "dark" fiber is not fundamentally different than "dead" copper." In the matter of the Petition for Arbitration of an Interconnection Agreement Between AT&T Communications of the Pacific Northwest, Inc. and GTE Northwest, Incorporated, Washington UTC Docket No. UT-960307, Commission Order Approving Interconnection Agreement, at 19-20 (1997).

652 47 U.S.C. § 153(29).

it is physically connected to the incumbent's network and is easily called into service. Thus, as indicated above, we conclude that dark fiber falls within the statutory definition of a network element.

329. We also note that our reading of the term "used" comports with the Commission's interpretation of the term "provide" in the context of section 271. Specifically, in the order denying Ameritech's application to provide long distance service pursuant to section 271 of the Act, the Commission rejected competitors' arguments that the term "provide" requires the BOC to "actually furnish" a checklist item.[653] Rather, the Commission concluded that the term "provide" requires incumbent LECs to "make available" to requesting carriers the checklist item in question upon reasonable demand.[654] Similarly, we interpret the term "used" in the definition of a network element to mean "capable of being used" in the provision of a telecommunications service.

330. We do not agree with GTE that, unlike vacant copper, dark fiber does not qualify as interoffice transport.[655] According to GTE, dark fiber differs from extra copper pairs in a cable because dark fiber is "unused inventory," whereas copper cable is installed to provide maximum flexibility.[656] We find this to be a distinction without a difference. Whether located in the loop plant or in the transport network of an incumbent LEC, both copper and fiber represent unused capacity. Accordingly, we conclude that dark fiber falls within the dedicated transport network element's "facilities, functions, and capabilities."[657]

(ii) Proprietary Concerns Associated with Dedicated Transport

331. In the *Local Competition First Report and Order*, the Commission did not identify any proprietary concerns associated with dedicated transport.[658] No party has identified any proprietary concerns associated with unbundled dedicated transport in this phase of the proceeding, and we find none. We therefore apply the "impair" standard of section 251(d)(2) to determine whether dedicated transport is subject to the unbundling obligations of the Act.

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653 *Ameritech Michigan 271 Order*, 12 FCC Rcd at 20601-02, para. 110.

654 Id.

655 GTE Comments at 64.

656 Id.

657 47 U.S.C. § 13(29). We address incumbent LEC concerns about their special need for fiber reserves below. *See infra* Section V.E.2.

658 The Commission reaffirmed this conclusion in the *Local Competition Third Reconsideration Order*, 12 FCC Rcd at 12480-12481, para 32.

(iii) Unbundling Analysis

332. We conclude that lack of access to unbundled interoffice transport impairs a carrier's ability to provide the services it seeks to offer. Requiring carriers to self-provision, or acquire from third-party providers, extensive interoffice transmission facilities materially increases the costs of market entry or of expanding service, delays broad-based entry, and limits the scope and quality of the competitor's service offerings. Neither self-provisioning interoffice transport facilities nor obtaining these facilities from third-party sources is an adequate alternative to the ubiquitous transmission facilities that a competitor can obtain from the incumbent LEC under section 251's unbundling obligations. Accordingly, we require incumbent LECs to provide unbundled access to their interoffice transmission facilities.

333. Although the record indicates that competitive LECs have deployed interoffice transport facilities along selected point-to-point routes, primarily in dense market areas, we find that the these facilities are not available, as a practical, economic, and operational matter, such that a requesting carrier's ability to provide the services it seeks to offer would not be impaired without access to the incumbent's ubiquitous interoffice transmission facilities. Specifically, the competitive transport facilities that currently exist do not interconnect all of an incumbent LEC's central offices and all interexchange carrier's points of presence within an MSA, or a substantial portion thereof.

334. Availability of Alternatives Outside the Incumbent's Network. Local competitors began deploying fiber networks in urban markets approximately 15 years ago.[659] Incumbent LECs have provided a significant amount of data indicating the location of transport facilities deployed by competitive LECs. For example, the incumbents submitted, through the USTA UNE Report, data that indicates that, by the end of 1998, competitive LECs had deployed interoffice transport in approximately 300 cities.[660] According to the USTA UNE Report, competitors have deployed nearly 30,000 route miles of fiber within the top 50 MSAs.[661]

335. In addition, the USTA UNE Report states that of the top 50 MSAs, forty-seven are served by at least three competitors; 29 are served by five or more competitors; and 16 are served by seven or more competitors.[662] The USTA Report also asserts that requesting carriers have deployed fiber in all but 15 of the MSAs ranked between 50 and

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[659] In 1985, New York state regulators granted Teleport authority to provide interoffice services in New York City. See Case 28891, *Teleport Communications* (NYDPS Jan., 7, 1985).

[660] Among the competitors with the most extensive fiber networks are AT&T, MCI, Sprint, Qwest, Level 3, Enron, MFN, Williams, Frontier, IXC, NEXTLINK, Intermedia, Hyperion, RCN, GST, ICG, Electric Lightwave and e.spire. *See USTA UNE Report* at II.

[661] *USTA UNE Report* Appendix B at II-6.

[662] Id.

150[663] and that competitors have centered their deployment of competitive fiber around "dense" wire centers, which USTA defines as wire centers with 40,000 or more access lines.[664] The USTA UNE Report also maintains that as of March 1999, incumbent LECs have the following number of wire centers that are served by at least one competitive fiber provider: Ameritech 161; Bell Atlantic 274; BellSouth 136; GTE 70; SBC 284; US WEST 118.[665]

336. The incumbents also provide evidence of the number of collocation arrangements in many of their wire centers. Relying on this data, the incumbents argue that there are significant alternatives to interoffice transport services available. According to USTA, the fact that competitors have operational collocation arrangements in approximately 874 dense wire centers implies the presence of competitive fiber "nearby."[666] In particular, according to the USTA UNE Report, of the wire centers with 20,000 or more lines, 90 percent in the SBC region, 72 percent in the Bell Atlantic region, and 74 percent in the US West region have collocation, which the incumbents assert signifies competitive transport is available.[667]

337. Bell Atlantic also argues that its Competitive Alternative Transport Terminal (CATT) service, currently offered on a trial basis with Metromedia Fiber Network Services (MFN), offers high capacity interoffice dedicated transport services to any collocated carrier. Bell Atlantic claims that MFN has entered into this CATT arrangement in a large number of end offices and that CATT will be generally available to other carriers pursuant to tariff.[668]

338. Other evidence in the record, however, undermines the incumbents' suggestion that competitive fiber is sufficiently available that transport should not be unbundled. MCI WorldCom, for example, provides information about the number of transport providers in the six major cities included in the USTA survey. According to MCI WorldCom, only eight of the 138 wire centers in Los Angeles have three or more collocators that provide transport.[669] Similarly, MCI WorldCom states that only four of 64 wire centers in Seattle have three or more collocators providing transport and only one

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663 *Id.*

664 The *USTA UNE Report* argues that there is a close correlation between collocation and the presence of competitive fiber facilities in these dense wire centers. *USTA UNE Report* at I-8.

665 USTA UNE Report at II-20.

666 *Id.*

667 *Id.* at II-8.

668 *See* Letter from Dee May, Federal Regulatory - Bell Atlantic, to Magalie R. Salas, Secretary, Federal Communications Commission, Docket 96-98 (filed July 13, 1999).

669 *See* MCI WorldCom August 13, 1999 *Ex Parte*.

of 25 wire centers in San Jose has three or more collocators providing transport. In addition, MCI WorldCom reports that, in Minneapolis, Richmond and Washington DC with 135, 51, and 158 wire centers respectively, no end office has three collocators providing transport.[670]

339. In addition, NorthPoint reports that the incumbent LEC is the only source of transport for at least 70% of central offices in which NorthPoint is collocated, even in dense wire centers in large metropolitan areas.[671] Similarly, Sprint asserts that in New York City, which is considered the most mature market in the country, Sprint continues to use the incumbent LEC extensively for transport because competitive fiber is not available in sufficient numbers of incumbent LEC central offices for it to offer a ubiquitous service in this area.[672]

340. Ubiquity. We conclude that, despite the evidence of some competitively deployed interoffice transmission facilities, lack of access to the incumbent's dedicated transmission facilities impairs a requesting carrier's ability to provide the services it seeks to offer. The alternatives cited in the evidence submitted by the incumbents are not ubiquitously available, and therefore competitive transport if not available as a practical, economic and operational matter.

341. As an initial matter, we are not persuaded that the incumbents' data accurately reflects the extent to which alternatives are actually available to competitors. In particular, we find that only at a granular, wire center-by-wire center level does the record show the presence of competitive alternatives to the incumbent's interoffice transport, albeit on a non-ubiquitous basis.[673] Thus, without access to unbundled

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670 Letter from Chuck Goldfarb, Director Law and Public Policy MCI WorldCom, to Larry Strickling, Chief, Common Carrier Bureau, Federal Communications Commission, CC Docket No. 96-98 (filed August 16, 1999). MCI WorldCom contends that this level of collocation evidences an "astonishingly small amount of transport competition." *Id.*

671 Letter from A. Richard Metzger, Jr., attorney for NorthPoint Communications, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed August 13, 1999) (NorthPoint submits data that in Atlanta, the incumbent LEC is the only transport alternative for 78% of COs where it is collocated. In the San Francisco metropolitan area, the incumbent LEC is the sole transport provider in 70% of COs where it is collocated. In New York, the number is 75%; Chicago, 71%, Los Angeles, 77% and Seattle, 73%.). MCI WorldCom submitted an *Ex Parte* showing that out of approximately 20,000 incumbent LEC central offices nationwide, there are two end offices with five competitor collocations; 28 end offices with four competitor collocations and 63 end offices with three competitor collocations offering competitive transport. *See* Letter from Chuck Goldfarb, Director Law and Public Policy MCI WorldCom to Larry Strickling, Chief, Common Carrier Bureau, Federal Communications Commission, CC Docket No. 96-98 (filed August 13, 1999.).

672 Sprint Comments at 32-33.

673 As discussed above, we recognize that the Commission has established a framework for incumbent LEC pricing flexibility in areas where competition for dedicated transport and most special access services has developed. Competition evidenced by the satisfaction of certain triggers, to the extent they are met, however, does not demonstrate that a requesting carrier is not impaired without access to unbundled

dedicated transport, requesting carriers would be forced to create a patchwork of alternative network facilities, where they have been deployed and are being offered to other carriers, or alternatively to construct their own transport facilities. The USTA UNE Report based its analysis on the markets that have attracted the most competitive transport entry. For example, the USTA UNE Report states that "[I]n the Los Angeles MSA, 72 wire centers serve 40,000 + lines. Of these, 20 have at least one collocated competitive LEC. An analysis of fiber route maps shows that CLEC fiber passes through at least 15 of 20 wire center areas with collocation."[674] Thus, according to USTA's data, 15 of 72 dense wire centers or approximately 21% of dense wire centers in the Los Angeles MSA include competitive fiber "nearby."[675]

342. We note that the incumbents do not explain what is meant by fiber that is "nearby." Nor do incumbents explain how having fiber "nearby" reflects the availability of ubiquitous transport alternatives. In addition, however, because the incumbents' data focuses only on the most dense wire centers, the data provides little to no information about the availability of transport in less dense wire centers in the same cities. If the analysis were expanded to include less dense wire centers, or wire centers serving less than 40,000 lines, the analysis would presumably show a lower percentage of competitive alternatives for the entire MSA than is reflected by the data provided by the incumbents.

343. Incumbents rely on the evidence of competitively deployed transport submitted in the USTA UNE Report to argue that competitive LECs are not impaired without access to unbundled transport facilities in locations where competitive LECs have already deployed transport. Specifically, the incumbents argue that the Commission should exclude dedicated transport from an incumbent LEC's unbundling obligations in any area where at least one requesting carrier has deployed transport facilities and has collocated its own transmission equipment in an incumbent LEC central office.[676] We

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dedicated transport. The Commission's pricing flexibility rules provide for flexibility where one requesting carrier is collocated in a serving wire center. These rules allow incumbent LECs to meet competitive transport entry with pricing flexibility. They do not, however, describe market conditions where requesting carriers would not be impaired without access to unbundled transport. Furthermore, even in those areas where competition for special access services is present and where, presumably the triggers for pricing flexibility have been met, the price differentials between TELRIC-priced transport and special access may persist for an indefinite period of time because the differential between unbundled transport and retail special access services are significant. According to one commenter, in the San Francisco Bay Area, PacBell's monthly access charge for a DS3 special access service is more than 50% higher than unbundled transport. In New York City, Bell Atlantic's monthly DS3 tariff rate is 258% higher than the comparable unbundled network element transport rate. In Miami, BellSouth's DS3 tariff rate is 353% higher than comparable unbundled network element interoffice transport rates. *See* Covad Comments at 45, Attachment 3, Aff. of Mark Shipley and David Rauschenberg, at para. 22-23.

674 USTA UNE Report at II-8.

675 *Id.*

676 GTE Comments at 10, 59 (stating that the Commission should not unbundle transport in wire centers with 15,000 or more access lines and the presence of one or more collocation arrangements); Ameritech Comments at 88 (stating that the Commission should not unbundle dedicated transport in dense

reject this argument. Although the incumbents' evidence shows that nearly 30,000 route miles of fiber have been deployed in the top 50 MSAs, there are few, if any alternative transport facilities outside the incumbent LECs' networks that connect all or most of an incumbent LEC's central offices and interexchange carriers' points of presence within an MSA.[677] Even where competitive alternatives exist, the alternatives generally do not travel the same routes as the incumbent's facilities. Thus, even if competitors were able to purchase indirect routing from alternative providers, to the extent alternatives exist, competitors more than likely have to route their traffic along indirect, inefficient routing patterns, thereby increasing their costs of transport.[678] Thus, contrary to arguments made by incumbent LECs, we find that the evidence demonstrates that a significant number of central offices in a given MSA are not effectively served by competitive fiber facilities.

344. We reject any bright-line test that triggers elimination of an incumbent LEC's unbundling obligation based on the presence of a single competitor that has self-provisioned transport in a particular market. As discussed above, in order to determine whether or not a requesting carrier's ability to provide the services it seeks to offer is "impaired" within the meaning of section 251(d)(2), we must determine whether alternatives outside the incumbent's network are available as a practical, economic, and operational matter, and determine whether unbundling a particular element is consistent with the goals of the Act.[679]

345. In particular, we find that basing our unbundling rules on the bright-line proposed by the incumbents does not address whether lack of unbundled access to the incumbent's ubiquitous transport facilities would impair other requesting carriers' ability to provide the services they seek to offer. Indeed, under the test proposed by the incumbents, the first new entrant to deploy transport facilities in any particular market would determine the degree and pace of competition in that market as well as the scope of

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wire centers with one or more collocation arrangements); SBC Comments at 50 (stating that the Commission should not unbundle dedicated transport in dense wire centers with one or more collocation arrangements); BellSouth Comments at 53 (stating that the Commission should not require unbundling of dedicated transport in Zone 1 and Zone 2); Bell Atlantic Comments at 30 (stating that the Commission should not require unbundling of dedicated transport in any area here at least one carrier has deployed its own network and there is the presence of one collocation arrangement); US WEST Comments at 48 (stating that the Commission should establish a presumption that incumbent LECs do not have to unbundle transport to or from wire centers with 20,000 or more loops and have one or more collocation arrangements).

677 *USTA UNE Report* at II-6. Covad states that it is dependent on incumbent LEC inter-office transport for 83 percent of its transport requirements and that it has a choice of transport providers for less than 7 percent of its collocation facilities. Covad Comments at 44. AT&T argues that it purchases 82% of its dedicated transport requirements from incumbent LECs because competitive offerings are not ubiquitously available. AT&T Comments at 122.

678 Letter from Robert Shanahan, Vice President, New England Voice & Data, to Magalie R. Salas, Secretary, Federal Communications Commission, Docket 96-98 (filed July 15, 1999) (describing Manchester, N.H. to Nashua, N.H. fiber buildout and increase of 11 miles over incumbent LEC's route if a competitive transport alternative is selected).

679 See supra Section (IV)(B)(4).

an incumbent LEC's unbundling obligation, and would potentially result in the presence of only two competitors in the market (*e.g.* a duopoly). Limiting the development of competition in such a manner is contrary to the goals of the Act and is inconsistent with the purpose of our unbundling rules.

346. In order to provide service, competitive LECs require dedicated transport facilities that are more extensive than those that are currently deployed along the point-to-point routes. The competitive alternatives that are available along limited point-to-point routes do not necessarily allow competitive LECs to connect their collocation arrangements or switching nodes according to the needs of their individual network designs. These carriers also require dedicated transport to deliver traffic from their own traffic aggregation points to the incumbent LEC's network for purposes of interconnection. Without access to the incumbent's ubiquitous transport facilities, competitive LECs are faced with the delays and costs of deploying their own transport facilities to meet the demand. Alternatively, competitive LEC's must utilize a patchwork of competitive alternatives, where available, to collect and route traffic to the required destination.

347. *Entrance Facilities*. Bell Atlantic and BellSouth specifically argue that extensive deployment by competitive LECs of the transport link between the interexchange carrier point of presence and an incumbent's serving wire center (the "entrance facility"), requires us to find that requesting carriers are not impaired in their ability to serve these point-to-point markets.[680] According to Bell Atlantic, for example, there are competitors that serve approximately 90 percent of Bell Atlantic's special access transport customers.[681] According to BellSouth, 19 of their 302 wire centers have at least one actual or pending collocation arrangement and one actual or pending entrance facility.[682]

348. We acknowledge that, based on the record before us, the entrance facility market appears to be the most mature segment of the interoffice transport market, and thus may, in some situations, provide requesting carriers with effective alternatives to unbundled transport for certain point-to-point routes.[683] The record does not indicate,

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680 *See* Letter from Susanne Guyer, Assistant Vice President, Bell Atlantic, to Magalie R. Salas, Esq., Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed August 25, 1999) (Bell Atlantic August 25 *Ex Parte*); Letter from Kathleen B. Levitz, Vice President – Federal Regulatory, BellSouth, to Magalie R. Salas, Esq., Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed August 16, 1999) (BellSouth August 16, 1999 *Ex Parte*).

681 *See* Bell Atlantic August 25, 1999 *Ex Parte.*

682 *See* BellSouth August 16, 1999 *Ex Parte.*

683 We note that, in addition, Bell Atlantic, Intermedia, Allegiance and Time Warner argue, in a joint *Ex Parte* filing, that the Commission should establish a limitation on loop transport combinations to prevent substitution of special access service for unbundled loop transport combinations in this segment of the transport market. Letter from Edward D. Young, Associate General Counsel, Bell Atlantic, Heather B. Gold, Vice President, Industry Policy, Intermedia Communications, Robert W. McCausland, Vice President,

however, the extent to which these facilities are available to other requesting carriers or whether the location of these facilities serve the transport needs of requesting carriers seeking to provide service to particular locations. In particular, the incumbents' data does not indicate the locations at which competitive entrance facilities terminate, or whether the facilities connect incumbent LEC serving wire centers to all or substantially all of the interexchange carrier points of presence. Accordingly, we cannot conclude, based on the record before us, that the competitive entrance facility market is providing requesting carriers with effective alternatives to unbundled transport for all, or substantially all of the routes requesting carriers would need in order to provide the services they seek to offer.

349. *Dark Fiber*. Incumbent LECs argue that some competitive LECs have deployed significant amounts of fiber to meet the growing demand for transport services, and that competitive LECs are not impaired without access to the incumbent's unbundled dark fiber.[684] Incumbent LECs further argue that the presence of competitive fiber in dense wire centers is evidence of a wholesale market for dedicated transport,[685] and support this claim by providing anecdotal evidence that competitors are swapping fiber capacity with each other.[686] We disagree. Rather, we agree with those commenters that argue that a competitive wholesale market for alternative network elements has not developed for dedicated transport, in part because of the lack of ubiquitous transport alternatives.[687]

350. Although there is evidence of transport deployment by non-incumbent providers along some point-to-point routes, the record does not support a general finding that requesting carriers can, on a ubiquitous basis, practically and effectively substitute transport services provided by other competitive carriers for unbundled transport. Indeed, the record indicates that the "fiber frenzy" and "bandwidth markets" cited by incumbent LECs are largely limited to portions of inter-city, long-haul networks that do not ubiquitously reach the interoffice segments of the incumbent LEC's network.[688] Lack of

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Regulatory and Interconnection, Allegiance Telecom, Inc., Don Shepheard, Vice President, Federal Regulatory, Time Warner Telecom, to Honorable William E. Kennard, Chairman, Federal Communications Commission, CC Docket No. 96-98 (filed September 2, 1999). ALTS agrees and supports excluding entrance facilities from an incumbent LEC's transport obligation where a given point-to-point route does not meet the impair standard. Letter from Jonathan Askin, Vice President, ALTS, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed September 3, 1999).

684 Bell Atlantic Comments at 31-32; GTE Comments at 82; US WEST Comments at 39-40. These carriers argue that the evidence of competitively deployed fiber has created a "wholesale market" for dark fiber.

685 Bell Atlantic Comments at 31; BellSouth Comments at 51; GTE Comments at 61.

686 *See* Letter from Kathleen B. Levitz, Vice President-Federal Regulatory, BellSouth to Jake Jennings, Special Advisor, Common Carrier Bureau, Federal Communications Commission, CC Docket No. 96-98 (filed July 22, 1999).

687 AT&T Comments at 122; CompTel Comments at 42; ALTS Comments at 51.

688 AT&T Reply Comments at 128; Covad Comments at 44-45; Waller Creek Reply

access to ubiquitous transport alternatives, which allow competitive LECs to interconnect their networks with all the central offices serving their customers, will impair these carriers' ability to provide the services they seek to offer.[689] Accordingly, we reject the incumbent LECs' argument that the presence of a competitive transport alternatives along certain routes is evidence that requesting carriers generally are not impaired without access to the incumbents' unbundled dark fiber.

351. In addition, to the extent that there may be excess capacity along these fiber routes, non-incumbent providers of competitive transport facilities are under no legal obligation to offer their excess capacity to their competitors. Moreover, interexchange carriers (IXCs) operate both as access customers of the incumbent LEC, as well as the incumbent's competitor in the local exchange market. These inter-carrier relationships complicate the functioning of an effective wholesale transport market because the alternative provider of transport is also a significant competitor.[690] In these circumstances, it is possible that local affiliates of IXCs could potentially discriminate against unaffiliated requesting carriers seeking access to competitive transport facilities by denying access altogether.

352. Although we include dark fiber in the unbundling obligations of section 251(c)(3), we note that GTE argues that it must maintain control of its dark fiber reserves because, as a carrier of last resort, it is obliged to provide service to any and all customers as the need arises.[691] GTE also argues that requiring incumbent LECs to make their reserve capacity available to new entrants discourages long term business planning and deprives the incumbents of the fruits of their investment.[692] We note that with the addition of electronics such as Dense Wave Division Multiplexing (DWDM) equipment, incumbent and competitive carriers alike can expand the bandwidth of existing capacity

Comments at 11.

689 For Example, New England Voice & Data argues that substituting lit OC-48 fiber for unbundled dark fiber would result in a material decrease in the reliability of its network because it would introduce three additional multiplexers, and thus three additional potential points of failure, at each collocation. In addition, New England Voice & Data claims that if it were required to purchase lit transport, New England Voice & Data's control and management of its interconnection links would become totally dependent upon incumbent LECs. In contrast, if New England Voice & Data is able to obtain access to unbundled dark fiber, it installs its own multiplexers to complete its SONET ring architecture and therefore controls its own provisioning, surveillance and repair. Thus, according to New England Voice & Data, substituting lit fiber for unbundled dark fiber in the interoffice transport segment of the network prevents it from installing a highly reliable SONET ring architecture to offer ring-based services and introduces additional failure points in a requesting carrier's end to end transport service. New England Voice & Data Comments at 12-13.

690 Because AT&T controls TCG and MCI WorldCom controls MFS, Sprint notes that it has considerable reluctance to shifting its access dependence from potential long distance competitors, the RBOCs, to its current long distance competitors. Sprint Comments at 34.

691 GTE Comments at 83-84.

692 *Id.* at 84.

without installing new dark fiber.[693] We find that technological solutions such as these largely address GTE's concern that unbundled access to dark fiber may adversely affect its ability to provide service. In addition, however, if incumbent LECs are able to demonstrate to a state commission that unbundling dark fiber threatens their ability to provide service as a "carrier of last resort," states have the flexibility to establish reasonable limitations and technical parameters for dark fiber unbundling.[694] We conclude, however, that for a limitation on dark fiber to be reasonable, it must relate to a likely and foreseeable threat to an incumbent LEC's ability to provide service as a carrier of last resort. In establishing reasonable limitations and technical parameters for dark fiber, states should acknowledge that requesting carriers require regulatory certainty in order to implement their business plans.

353. *Other Technologies.* We reject Bell Atlantic's proposal that the Commission consider the availability of wireless transport in our unbundling analysis.[695] The record does not demonstrate that wireless transport options are available across any particular MSA. Nor does the record address the question of whether integrating wireless transport offerings into a wireline transport network allows providers to offer service of the same quality and functionality as they would be able to offer using wireline alternatives. Notably, NEXTLINK, the largest Local Multipoint Distribution Service (LMDS) licensee and a potential source of competitive wireless transport, supports the continued availability of unbundled dedicated transport network elements.[696]

354. *Tariffed Offerings.* We also reject GTE and US West's argument that competitive LECs have access to ubiquitous transport through the use of the incumbents' special access tariff arrangements.[697] As discussed above, we give little weight to the

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693 Dense Wavelength Division Multiplexing (DWDM) is a multiplexing technique that permits multiple SONET or other optical signal formats to be carried on one fiber on different wavelengths. The capacity of existing DWDM systems now exceeds several hundred gigabits per second (Gbps), and has been approximately doubling each year for the past several years. DWDM allows carriers to extend the capacity of their embedded fiber.

694 For example, the Texas Commission allows incumbent LECs, upon establishing need to the satisfaction of the state commission, to revoke leased fiber from competitive LECs with 12 months notice. The Texas commission's dark fiber unbundling rules also allow incumbent LECs to take back underused (less than OC-12) fiber, and forbid competitors in any two year period from leasing more than 25% of the dark fiber in a given segment of the network. We believe the measures established by the Texas PUC address the incumbent LEC's legitimate concerns. Texas PUC Comments at 16-17. We note that MGC, a competitive LEC that urges the Commission to unbundle dark fiber, also supports limitations such as those adopted in Texas. *See* Letter from Scott A. Sarem, Assistant Vice President, Regulatory, MGC Communications, to Christopher Libertelli, Attorney, Common Carrier Bureau, Federal Communications Commission, CC Docket No. 96-98 (filed August 12, 1999).

695 Bell Atlantic Comments at 30.

696 NEXTLINK Reply Comments at 27.

697 GTE Comments at 61. *See also* Letter from Melissa Newman, Vice President – Federal Regulatory, US West, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No.

incumbent LEC's special access tariffs.[698] Moreover, the Commission previously rejected this argument in the *Local Competition First Report and Order.*[699] For reasons the Commission articulated in that order, we reject the incumbents' argument here. If we were to adopt the incumbents' approach, the incumbents could effectively avoid all of the 1996 Act's unbundling and pricing requirements by offering tariffed services that, according to the incumbents, would qualify as alternatives to unbundled network elements. This would effectively eliminate the unbundled network element option for requesting carriers, which would be inconsistent with Congress' intent to make available to requesting carriers three different competitive strategies, including access to unbundled network elements.

355. Cost. We conclude that the costs of self-provisioning dedicated transport facilities materially diminish a requesting carrier's ability to provide the services it seeks to offer. We agree with commenters that argue that replicating the incumbent's vast and ubiquitous transport network would be prohibitively expensive, and delay competitive entry.[700] In the *Local Competition First Report and Order,* the Commission concluded that a requesting carrier would incur "much higher costs" if it "had to construct all of its own facilities" to match the scope of an incumbent LEC's interoffice transport network.[701] Nothing has changed in the intervening three years to cause us to alter this conclusion. Indeed, based on the record before us, we conclude that the material costs and delays associated with self-provisioning duplicate, ubiquitous transport facilities would impair a competitive LEC's ability to offer services to a broad base of consumers. Accordingly, we require incumbent LECs to offer unbundled access to their dedicated transport facilities.

356. Self-provisioning dedicated transport requires competitive LECs to incur significant direct and other costs, including the cost of fiber, the cost of deploying fiber in public rights of way, trenching and the cost of purchasing and collocating the necessary transmission equipment.[702] For example, the record indicates that the direct equipment

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96-98 at Pg. 2 (filed August 18, 1999) (arguing that the relevance of tariffed services as a substitute for unbundled transport in the *Local Competition First Report and Order* is "no longer valid precedent.").

698 *See supra* Section (IV)(B)(4).

699 *Local Competition First Report and Order*, 11 FCC Rcd at 15644, para. 287.

700 California PUC Comments at 4-5; AT&T Comments at 96; Cable and Wireless Comments at 36; CompTel Comments at 40; CPI Comments at 21; Sprint Comments at 34-36. *See also* Letter from John J. Heitmann, representing ALTS, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed Aug 6, 1999).

701 *Local Competition First Report and Order*, 11 FCC Rcd at 15718, para. 441.

702 This can include such things as fiber distribution panels, optical terminating equipment, multiplexers, digital cross connects, test access equipment, digital loop carrier equipment, power distribution panels, and cable racks.

costs of purchasing interoffice transport equipment exceeds $300 per line,[703] and that the cost of constructing alternative transport facilities (*e.g.,* digging and backfilling trench) are between $200,000 - $300,000 per mile in densely populated areas.[704] According to GTE, the direct cost of constructing a one hundred mile dedicated transport facility is close to $3 million.[705]

357. In addition, in order to use alternative transport facilities, either through self-provisioning or through third-party providers, a competitive LEC must collocate at the incumbent's central office. Collocating in each end office imposes materially greater costs on requesting carriers than would the purchase of the incumbent's interoffice transport facilities. Based on the record, it appears that the current range for non-recurring charges for provisioning physical collocation arrangements is between $15,000 and $508,000 for each central office where a competitor serves customers with unbundled loops.[706] This results in an increase of between 15 and 20 percent to the costs of the equipment installed in the cage.[707] In addition to the substantial costs of constructing and collocating self-provisioned transport facilities, competitive LECs must incur additional of negotiating and obtaining municipal rights-of-way permissions.[708]

358. If a competitive LEC were required to obtain transport from multiple, non-ubiquitous alternative providers of transport, to the extent it is available, they would incur additional costs associated with coordinating back office billing and collection arrangements, as well as the costs associated with coordinating operational issues arising out of use of multiple vendors.[709] While we acknowledge that the precise level of costs will vary according to the business plans of each competitive LEC, we conclude that contracting with third-parties to coordinate among multiple carriers in order to serve ubiquitously would materially diminish the ability of a requesting carrier to provide the

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703 AT&T Comments at 121.

704 *Id.* at 120.

705 GTE Comments at Exhibit B, page 32.

706 *See* CompTel Comments at 39 (arguing that total cost of switch installation is $4-6 million).

707 AT&T Comments at 96. *See also* Bell South Comments, Attachment A at 1 (describing $128,700 cost of purchasing necessary equipment for one collocation arrangement.).

708 NEXTLINK states that to obtain a telecommunications franchise from the City of New York, it was required to pay "exorbitant fees" to deploy facilities in public rights of way. NEXTLINK Reply Comments at 29 (arguing that the City of New York assesses exorbitant fees and assesses a multitude of discriminatory, non-competitively neutral requirements that are not imposed on Bell Atlantic.); AT&T Comments at 121 (citing Beans Affidavit at para 12, describing 4% gross revenue fees associated with Dearborn, Michigan franchise). *See also* Allegiance Comments at 19; Sprint Comments at 33; Network Access Solutions Reply Comments at 11; NEXTLINK Reply Comments at 29; Qwest Reply Comments at 72-77;.

709 Sprint Comments at 34.

services it seeks to offer. Moreover, because purchasing transport capacity is generally less expensive at higher levels of capacity, competitive LECs using multiple providers would lose efficiencies they would otherwise achieve if they were able to aggregate their traffic over the facilities of one ubiquitous provider.[710]

359. We reject the incumbent LECs' cost models that purport to demonstrate that the fact that competitors have deployed a significant amount of fiber in downtown business districts is evidence that the cost of self-provisioning transport facilities does not impair a competitive LEC's ability to provide the service it seeks to offer.[711] We find that cost models estimating the costs of self-provisioning transport are highly sensitive to assumptions that are not necessarily representative of the actual market place. For example, BellSouth provides a cost model that analyzes the transport networks of several competitive LECs located in Atlanta, and projects that the costs to the competitive LECs of extending the scope of their network to reach all central offices within that city is between $35 and $38 per DS1.[712] BellSouth does not explain the difference between its model's cost estimate of $35-$38 per month, per dedicated DS1 and the cost estimate of $84 per month, per dedicated DS1 generated by a model the Commission developed in its universal service proceeding.[713] Nor does BellSouth explain why the costs generated by its model are significantly lower than the costs generated by the model developed by Hatfield Associates, Inc., which shows the cost of a DS-1 to be $110 per month.[714] Moreover, it is not clear whether BellSouth's cost estimates assume full utilization of the transport facilities. For competitive LECs entering the market that have little usage, the relevant comparison between the costs of self-provisioning and purchasing unbundled

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710 CompTel Comments at 42

711 *See, e.g., USTA UNE Report* at II-1; GTE Comments at Exhibit B, at 22-33 (Network Engineering Consultants Inc.'s "Analysis of Alternative Network Elements Available to CLECs"); Bell Atlantic Comments at Exhibit C; Decl. of R. Dean Foremann/Charles L. Jackson, at 11-18. BellSouth analyzes AT&T's existing transport facilities in one representative market, Atlanta, and estimates that AT&T could build out its existing facilities to deploy a ubiquitous transport network for an estimated average cost per month of $36 per DS1 transport facility. *See* Letter from Kathleen Levitz, Vice President – Federal Regulatory BellSouth, to Magalie R. Salas, Secretary, Federal Communications Commission (filed July 30, 1999) (BellSouth estimates MCI's cost per DS1 transport at $35 per month; ICG's cost per DS1 transport at $36 per month; and e.spire's cost per DS1 transport at $38 per month). *See also* Comments of Bell Atlantic at 26; Comments of GTE at 48 (Appendix D).

712 *See* Letter from Kathleen Levitz, Vice President – Federal Regulatory BellSouth, to Magalie R. Salas, Esq., Secretary, Federal Communications Commission (filed July 30, 1999).

713 *See generally Commission Takes Action to Reform Universal Service Support for Non-Rural Carriers Providing Service in High-Cost Areas and Commission Adopts Framework for Federal Universal Service High-Cost support Mechanism; Commission Seeks Comment on the Input Values for the Forward-Looking Cost Model*, CC Docket No. 96-45; 96-262; 97-160, FCC No. 99-17 (released May 27, 1999).

714 BellSouth's fill factor assumption of 75% may also not be representative of actual market conditions for requesting carriers.

transport from the incumbent should be based on the number of DS1s actually carried, not on the number of DS1s that could potentially be used by the requesting carrier.

360. Ameritech proposes the use of a model that, it asserts, shows that in two second tier cities in Ameritech's territory, it is economical for competitive LECs to build ubiquitous transport networks of less than 100 miles to wire centers with a total of 100,000 access lines.[715] Even assuming, *arguendo*, that Ameritech's model accurately projects the theoretical viability or profitability of extending a competitive LEC's transport network, as noted by the Supreme Court, the ability to "amass earnings" alone is not dispositive of whether or not a requesting carrier is impaired without access to the incumbent's unbundled transport. [716]We therefore find that cost models proposed by BellSouth, Ameritech, and others do not accurately indicate the extent to which the costs associated with self-provisioning transport materially diminish a requesting carrier's ability to provide the services it seeks to offer. Finally, as discussed above, we do not base our unbundling analysis on individual business case analyses.[717]

361. Timeliness. We conclude that lack of access to the incumbent's interoffice transport network would materially delay a requesting carrier entry into the local market or alternatively delay expansion of an existing carrier's service offerings. Whether requesting carriers self-provision interoffice transport, or purchase it from third-party providers, they must collocate their own equipment at the incumbent's central office. Thus, collocation is an essential prerequisite to self-provisioned and third-party provisioned transport, and the time required to collocate affects a requesting carrier's ability to provide service using dedicated transport.

362. Incumbents and requesting carriers provide different estimates about the time required to implement a single collocation arrangements in an incumbent LEC's central office. In general, competitive LECs argue that each collocation arrangement requires between six months and a year to provision.[718] In addition, these carriers argue that the delay associated with implementing collocation arrangements is compounded as competitive LECs expand their networks and seek to establish more collocation

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715 Ameritech Fitzsimmons Aff. at pg. 32.

716 *Iowa Utils. Bd.*, 119 S. Ct. 721, 734 ("An entrant whose anticipated annual profits from the proposed service are reduced from 100% of investment to 99% of investment has perhaps been "impaired" in its ability to amass earnings, but has not ipso facto been 'impair[ed] . . . in its ability to provide the services it seeks to offer.").

717 *See supra* Section (IV)(B)(2).

718 *See supra* Section (V)(D)(1). AT&T Comments at 91 (citing collocation delays of six to eight months); CompTel Comments at 40 (stating that collocation takes several months at a minimum); MCI WorldCom Reply Comments at 52 (stating that collocation takes 6 months to a year). New England Voice & Data notes that it took six months to gain access to conduit space to pull cable 11,000 feet of fiber from Bell Atlantic's switch to New England Voice & Data's switch. New England Voice & Data Comments at 14.

arrangements.[719] Incumbent LECs respond that they have provisioned collocation to requesting carriers in a timely fashion and on a broad scale.[720]

363. We acknowledge that collocation arrangements necessarily require some time to implement, and that the amount of time required to order and provision a collocation arrangement will vary from incumbent LEC to incumbent LEC and by requesting carrier. Accordingly, we do not attempt to specifically quantify what constitutes a reasonable provisioning interval for a single collocation arrangement. We agree, however, with commenters that provisioning the multiple collocation arrangements needed to provide a ubiquitous transport network within an MSA would compound significantly the inherent delays associated with provisioning a single collocation arrangement. NorthPoint contends that most incumbent LECs have imposed "governors" on the number of collocation applications they will accept.[721] Specifically, BellSouth has limited the number of collocation applications a requesting carrier may file to five per month, thereby delaying ubiquitous rollout of services.[722] Requiring requesting carriers to collocate in numerous end offices in order to obtain ubiquitous transport facilities would materially delay the ability of requesting carriers to enter a market or to expand its service offerings to the greatest number of consumers.

364. Several carriers argue that the process of securing necessary access to rights-of-way, pole attachments, and conduit space significantly delays their ability to compete.[723] For example, NEXTLINK notes that it took two years to negotiate and obtain a telecommunications franchise from the City of New York before it could deploy competitive facilities, and that it must negotiate separate agreements with each municipality traversed by its fiber ring.[724] We find that the delays of this magnitude

719 MCI WorldCom estimates that establishing a single collocation arrangement requires approximately five months before the arrangement is in place. MCI WorldCom also argues, however, that if a requesting carrier seeks to expand the scope of its services by requesting collocation arrangements, the collocation delay amounts to several years before it can provide service. MCI WorldCom Comments, Herold Declaration, at para. 10-11.

720 Ameritech Comments at 28, 77; SBC Reply Comments at 16; US WEST Reply Comments at 44; Bell Atlantic Reply Comments at 14; BellSouth Reply Comments at 36. SBC submitted an *Ex Parte* presentation which states that the average caged collocation interval in Texas is 90 days and 55-70 days for cageless collocation. In California, the average caged collocation interval is 120 days and 110 days for cageless. *See* Letter from Lincoln E. Brown, Director – Federal Regulatory, SBC, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed July 15, 1999).

721 *See* Letter from John J. Heitmann, representing ALTS, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed Aug 6, 1999).

722 See id.

723 New England Voice & Data Comments at 14; NEXTLINK Reply Comments at 28.

724 NEXTLINK Reply Comments at 29.

associated with obtaining authority to access public rights-of-way materially delay the ability of a requesting carrier to self-provision transport.

365. Functionality and Quality. We conclude that requiring carriers to utilize alternative sources of transport imposes functional and quality disadvantages that materially diminish a requesting carrier's opportunity to provide the services it seeks to offer. If the Commission were to adopt the incumbent LEC proposals to eliminate unbundled access to interoffice transport in areas where there are one or more alternative suppliers in the market, carriers would have to use multiple alternative suppliers, where available, for their transport requirements. Using a patchwork of transport offerings consisting of facilities acquired from competitive LEC/competitive access providers and the incumbent LEC, in lieu of ubiquitous incumbent LEC transport facilities, would introduce additional complexity into a ubiquitous end-to-end transport network. For example, Sprint notes that when facilities of more than one carrier are involved, repair times are roughly three times longer than if the entire transport network were controlled by one carrier or provisioned exclusively through unbundled transport.[725] In addition, Sprint argues that an end-to-end transport offering provisioned by multiple providers may require several digital-to-analog and analog-to-digital conversions or protocol conversions, which could lower total connection speeds otherwise achievable with a single provider transport offering.[726] Although we do not conclude that digital-to-analog or analog-to-digital protocol conversions result in a material quality degradation, we find that, as a general matter, requiring requesting carriers to utilize a patchwork of competitive alternatives, to the extent they are available, to collect and route traffic to the required destination can result in a material degradation of quality in the service the requesting carrier to seeks to provide.

366. Goals of the Act. We recognize that requiring incumbent LECs to unbundle dedicated transport may be marginally overinclusive because of the presence of some alternative fiber along selected point-to-point routes in dense markets. We believe, however, that the benefits of uniform transport unbundling outweigh the costs of creating a patchwork regime in which incumbent LECs would likely seek to litigate its transport unbundling obligation on particular point-to-point routes where transport alternatives are arguably available. As we stated above, unbundling requirements that provide uniformity and certainty to the market will allow new entrants and fledgling competitors to implement national and regional business plans and attract capital investment. Litigation over the incumbents' unbundling obligations requires the parties to these agreements and the state commissions that approve them to expend vast amounts of time and resources and would impede the development of competition.

725 Sprint notes that nationwide, incumbent LECs meet transport provisioning deadlines 90 percent of the time; while CLECs meet these dates between 48 and 68 percent of the time. Sprint Comments at 34 and Appendix B, Decl. of Kevin E. Brauer, at 4.

726 Sprint Comments, Appendix D, "Sprint Experience with BellSouth," at 4.

367. Creating a patchwork of transport unbundling obligations would be inconsistent with the goal of the 1996 Act to facilitate rapid entry into the local exchange market. We reiterate the Commission's conclusion in the *Local Competition First Report and Order* that "[w]e recognize that there are alternative suppliers of interoffice facilities in certain areas. We are convinced, however, that entry will be facilitated if competitors have greater, not fewer, options for procuring interoffice facilities as part of their local networks, and that Congress intended for competitors to have these options available from competitors."[727] Furthermore, we believe that our decision to unbundle interoffice transport is consistent with Congress' recognition, in section 271, that providing unbundled access to interoffice transport would encourage rapid entry into the local exchange market.[728]

368. We further find that the allegations of the competitive harms resulting from a uniform transport unbundling obligation are overstated. We believe that there are significant operational and technical incentives for a requesting carrier to eliminate its reliance upon transport provided by incumbent LECs over the long term.[729] Where alternative providers build transport facilities to areas exclusively served by the incumbent LEC's facilities, requesting carriers may substitute those alternative sources of transport as they become available. We therefore expect the need for unbundled transport will decrease as competitive transport networks become more ubiquitous. We will closely monitor the developments in the transport market to determine whether the transport market, or a particular segment of this market, is supplying requesting carriers with effective alternatives to the incumbent LEC's unbundled network elements when we reexamine these rules in three years.[730]

b. Shared Transport

369. We find that lack of unbundled access to incumbent's shared transport would impair the requesting carrier's ability to use unbundled switching.[731] In particular,

727 *Local Competition First Report and Order*, 11 FCC Rcd. 15718-15719, at para 441.

728 47 U.S.C. § 271(2)(B)(v).

729 Sprint contends that better financial results, over the long run, should be achievable by increasing the return from capital dollars spend rather than continuing to expense to multiple third party transport providers. Sprint argues that dependence upon external vendors also increases the business uncertainties and risks (in terms of pricing fluctuations, quality control, choice of vendors, changes in vendor business strategy) associated with third party transport provisioning. Sprint Comments, Declaration of Kevin Brauer, at 4.

730 *See* Letter from Ernest L. Bush, Jr., Assistant Vice President – BellSouth Telecommunications,to Lawrence Strickling, Chief, Common Carrier Bureau, Federal Communications Commission, CC Docket No. 96-98 (filed August 16, 1999) (arguing that the "entrance facilities" or POP to incumbent LEC wire center segment of the transport market has developed to such an extent that requesting carriers are not impaired without access to unbundled transport in this market segment.).

731 We note at the outset that a requesting carrier that uses its own self-provisioned switch,

without access to unbundled shared transport, a requesting carrier would have to self-provision or purchase dedicated transport from the incumbent, which would materially increase the costs and decrease the quality of services the requesting carrier could provide, and would materially limit the carrier's ability to serve a broad base of customers. Accordingly, where an incumbent LEC provides requesting carriers with access to unbundled switching, we require incumbent LECs also to provide access to unbundled shared transport services.

(i) Definition

370. In the *Local Competition Third Reconsideration Order*, the Commission defined shared transport as transmission facilities shared by more than one carrier, including the incumbent LEC, between end office switches, between end office switches and tandem switches, and between tandem switches in the incumbent LEC's network.[732] The Commission clarified in that proceeding that incumbent LECs are not required to provide shared transport between incumbent LEC switches and serving wire centers.[733] No commenter in this phase of the proceeding specifically addressed the definition of shared transport and the record provides no basis for modifying our definition of shared transport.

371. Ameritech, however, argues that shared transport is not an "unbundled" network element within the meaning of section 251(c)(3). Specifically, Ameritech argues that under the Supreme Court's ruling, incumbent LECs must provide to requesting carriers pre-assembled combinations of individual unbundled network elements if the element can be purchased separately.[734] Because shared transport is technically inseparable from unbundled switching requesting carriers do not have the option of using unbundled shared transport without also taking unbundled local switching. Thus, according to Ameritech, the shared transport element is not an "unbundled" element within the meaning of section 251(c)(3).[735]

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rather than unbundled local switches obtained from an incumbent LEC, to provide local exchange and exchange access service would use dedicated transport facilities to carry traffic between its network and the incumbent LEC's network. Thus, the only carrier that would need shared transport facilities would be one that was using an unbundled local switch. Requesting carriers may also utilize unbundled tandem switching to substitute shared transport for common transport in situations where the requesting carrier is not providing local service to the end user. We note that this use of shared transport is currently pending before the Commission and we expect to address it in connection with the *Further Notice* adopted in this proceeding.

732 The definition of shared transport includes shared transport from one end office to another end office. See 47 C.F.R. § 51.319(d)(1)(ii). It does not include the provision of shared transport from an end office to an end user. *See* Centennial Joint Comments at 5.

733 *Local Competition Third Reconsideration Order*, 12 FCC Rcd 12453, at para. 27.

734 Ameritech Comments at 94-96.

735 *Id.*

372. We reject Ameritech's arguments. The Supreme Court upheld the Commission's interpretation that the phrase "on an unbundled basis" in section 251(c) does not refer to physically separated elements but rather to separately priced elements.[736] Shared transport is an "unbundled" element because it consists of separately priced switching and transport network elements. The fact it is technically infeasible for a competitor to use shared transport with self-provisioned switching is irrelevant to whether an element is "unbundled" pursuant to section 251(c)(3). In addition, the Eighth Circuit, in affirming our decision in the *Local Competition Third Reconsideration Order,* rejected Ameritech's argument when it held that shared transport meets the definition of an unbundled network element because it is a "feature, function, [or] capability," that is provided by facilities and equipment used in the provision of a telecommunications service.[737] Accordingly, we conclude that shared transport meets the definition of an unbundled network element.

(ii) Proprietary Concerns Associated With Shared Transport

373. Ameritech asserts that its routing table used to provide shared transport is proprietary. As discussed above, we reject Ameritech's claim because we find that incumbent LECs may not withhold access to unbundled local switching on the grounds that switch routing tables are proprietary in nature under section 251(d)(2)(A).[738] With the exception of Ameritech, no commenter identifies any proprietary concerns associated with the provision of shared transport, and we identify none. Accordingly, we analyze shared transport under the "impair" standard of section 251(d)(2)(B).

(iii) Unbundling Analysis

374. We conclude that a requesting carrier's ability to provide the services it seeks to offer is impaired without access to the incumbent's unbundled shared transport. Without access to unbundled shared transport, a requesting carrier would have to self-provision or purchase dedicated transport from the incumbent, which would materially increase the costs and decrease the quality of services the requesting carrier could provide, and would materially limit the carrier's ability to serve a broad base of customers.[739] Accordingly, we conclude that incumbent LECs must provide unbundled access to shared transport.

375. Costs and Quality. We find that lack of unbundled access to the incumbent's shared transport facilities materially increases a requesting carrier's costs of

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736 *Iowa Utils. Bd.*, 119 S. Ct. at 737.

737 *Southwestern Bell Tel. Co. v. Federal Communications Commission*, 153 F.3d 597, 603 (8th Cir. 1998).

738 *See supra* Section (V)(D)(1).

739 AT&T Comments at 99; Centennial Joint Comments at 7; TRA Comments at 39.

providing service. As described above, we find that there is a lack of ubiquitous transport alternatives available to requesting carriers. Thus, without access to the incumbent's shared transport facilities, a requesting carriers must either deploy its own dedicated facilities or purchase dedicated transport from the incumbent. Because requesting carriers, in the early stages of entering the local market, may not yet have sufficient market information to forecast accurately their traffic volumes, they may miscalculate the amount of dedicated transport capacity they will need. Specifically, an inability to reasonably forecast traffic volumes would likely cause a requesting carrier to purchase an insufficient amount, or conversely, too much dedicated transport capacity. In shared transport arrangements, the switch routes the competitor's traffic through the most efficient trunking group available. The trunking group is shared among many users, including the incumbent LEC's end users, thereby reducing requesting carrier costs and utilizing capacity only when necessary to route and complete a call.[740]

376. In addition, as traffic demands increase, a requesting carrier will incur a non-recurring charge each time it purchases additional transport capacity. In contrast, where a requesting carrier purchases unbundled shared transport to meet increased customer demand, it effectively purchases the entire capacity of the incumbent LEC's network and will not incur non-recurring charges for additional increments of dedicated transport capacity. Purchasing only those increments of capacity that the requesting carrier requires to meet demand eliminates inefficient use of dedicated transport facilities. In addition, at low volumes requesting carriers will incur significantly higher recurring, per-minute costs to substitute dedicated transport for shared transport arrangements at low volumes. We reiterate the Commission's conclusion in the *Third Order on Reconsideration* that "the relative costs of dedicated transport, including the associated NRCs [non-recurring charges], is an unnecessary barrier to entry for competing carriers."[741]

377. According to Ameritech, competitive LECs have the option of using its end office integration (EOI) service, a tariffed, retail service that Ameritech claims will carry, on a minute-of-use basis, whatever interoffice transport traffic the competitive LEC delivers to its point of interconnection.[742] Under this plan, Ameritech would not require requesting carriers to order dedicated transport facilities until their actual volume levels justified provisioning a dedicated trunk. Consistent with the little weight we afford the

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740 We recognize that competitors face significant demand uncertainty, particularly in the early stages of entry, but as the local exchange market matures, competitors will be required to assume the normal business risks of forecasting demand and provisioning transport to meet this demand.

741 *Local Competition Third Reconsideration Order*, 12 FCC Rcd at 12488, para 50. In the *Third Reconsideration* proceeding, AT&T contended that the cost is $.041767 per minute for dedicated transport plus associated non-recurring charges. AT&T claimed that Ameritech would charge a total of $5008.58 per DS1 and $58,552.87 per switch. AT&T argued that this compares with $.000776 per minute for unbundled shared transport. Ameritech responded that the correct price for tandem routed dedicated facilities cost is $.0031148 per minute plus associated NRCs. *Id.*

742 Ameritech Comments at 72.

incumbents' tariffed offerings for consideration as an alternative to dedicated transport, we reject the argument that Ameritech's tariffed EOI service eliminates the obligation to unbundle shared transport.[743]

378. We agree with commenters that argue that the ability to obtain access to shared transport enables them to handle traffic at peak loads and maintain call blockage levels that are at parity with those of the incumbent LECs.[744] As the Commission stated in the *Local Competition Third Reconsideration Order*, a new entrant entering the local market with smaller traffic volumes would have to maintain greater excess transport capacity relative to the incumbent LEC in order to provide the same level of service quality (*i.e.* same level of successful call completion) as the incumbent LEC.[745] We conclude a requesting carrier would be impaired without access to unbundled shared transport because it would have to choose between purchasing excess capacity or incurring increased call blockage rates.

379. Goals of the Act. We find that requiring incumbent LECs to provide unbundled access to shared transport is consistent with the Act's goal of encouraging requesting carriers to rapidly enter the local market and serve the greatest number of customers. Requiring unbundled access to shared transport is particularly important because it addresses the transport needs of requesting carriers in the early stages of competitive entry by allowing competitors to efficiently purchase transport facilities as they ramp up toward higher-capacity dedicated transport requirements. Furthermore, when used in conjunction with unbundled switching, requesting carriers may find it economical to serve the small business and residential markets using shared transport because these market segments may not always support traffic volumes that justify using dedicated transport services. Accordingly, we find that requiring unbundled access to shared transport promotes the prompt development of competition to serve the greatest number of customers, as intended by the Act.

F. Signaling Networks and Call-Related Databases

1. Signaling Networks

743 *See supra* Section (IV)(B)(4). There are also substantial questions concerning whether Ameritech's EOI includes the transport and termination charges Ameritech would levy on top of the per-minute fees and the non-recurring charges that Ameritech would impose for establishing its EOI service.

744 MCI WorldCom Comments 62 and Tab 4, Decl. of John M. Wimmer, at para. 28; AT&T Reply Comments at 108.

745 *Local Competition Third Reconsideration Order*, 12 FCC Rcd at 12488, para 51 (citing William W. Sharkey, The Theory of Natural Monopoly, 184-85 (1982) ("that for a given number of circuits the economies [of scale] are more pronounced at higher grades of service (lower blocking probability). The economics of scale, however, decline substantially as the number of circuits increases. Therefore for small demands, a fragmentation of the network could result in a significant cost penalty because more circuits would be required to maintain the same grade of service. At large demands, the costs of fragmentation are less pronounced.") *Id.*

a. Background

380. In the *Local Competition First Report and Order*, the Commission concluded that incumbent LECs, upon request, must provide nondiscriminatory access to their signaling networks on an unbundled basis.[746] The Commission stated that it was technically feasible for incumbent LECs to provide such access, and that such access was critical to entry in the local exchange market.[747] The Commission concluded that incumbent LECs must provide unbundled access to signaling networks as part of the unbundled switch network element as well as on a standalone basis.[748]

381. In the *Notice,* we sought comment on the application of the "necessary" and "impair" standards to previously identified unbundled network elements, including signaling networks.[749] The *Notice* also requested that parties include specific costs and an analysis of the availability of alternative signaling facilities.[750]

382. The majority of state commissions and competitive LECs commenting in this phase of the proceeding argue that the incumbent LECs' signaling networks should be unbundled because alternatives to the incumbents' signaling networks are more costly, have lower quality, and do not provide the ubiquity of the incumbents' networks.[751] The

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746 *Local Competition First Report and Order*, 11 FCC Rcd at 15738, para. 479. These networks are referred to as "out of band" signaling networks, and they simultaneously carry signaling messages for multiple calls. In general, most LECs' signaling networks adhere to a Bellcore standard Signaling System 7 (SS7) protocol. SS7 networks use signaling links to transmit routing messages between switches, and between switches and call-related databases (such as the Line Information Database, Toll Free Calling Database, and Advanced Intelligent Network databases). These links enable a switch to send queries via the SS7 network to call-related databases, which return customer information or instructions for call routing to the switch. A typical SS7 network includes a signaling link that transmits signaling information in packets, from a local switch to a signaling transfer point (STP), which is a high-capacity packet switch. The STP switches packets onto other links according to the address information contained in the packet. These additional links extend to other switches, databases, and STPs in the incumbent LECs' networks. A switch routing a call to another switch will initiate a series of signaling messages via signaling links through a STP to establish a call path on the voice network between the switches. *Id.* at paras 479-483.

747 *Id.* at 15738, para. 479.

748 *Id.* at 15738-41, paras. 479-483.

749 *Notice* at para. 33.

750 *Id.*

751 *See* Florida PSC Comments at 6-7; Illinois Commission Comments at 14; Iowa Comments at 6; Kentucky PSC Comments at 2; Allegiance Comments at 20; Cable & Wireless Comments at 37-38; Choice One Joint Comments at 18; Cox Comments at 34-36; KMC Comments at 16-17; Level 3 Comments at 15-16; Net 2000 Comments at 15-16. *But see* MGC Comments at 31.

incumbent LECs argue that based on the availability of alternative signaling providers, requesting carriers are not impaired in their ability to provide services.[752]

b. Discussion

383. We conclude that without unbundled access to the incumbent LECs' signaling networks, a requesting carrier's ability to provide the services it seeks to offer is impaired. Requiring a requesting carrier to obtain signaling from alternative sources would materially diminish its ability to provide the services it seeks to offer, due to the quality differences between the signaling networks available from the incumbent LEC and those available from alternative providers of signaling. As described below, we conclude that neither self-provisioning signaling networks, nor obtaining this element from third-party sources, is a sufficient substitute that would justify excluding signaling networks from the incumbent LECs' unbundling obligation under section 251(c)(3). We therefore require incumbent LECs to provide requesting carriers with unbundled access to their signaling networks.

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[752] *See* Ameritech Comments at 114-116; BellSouth Comments at 76; GTE Comments at 54-56; SBC Comments at 43; US WEST Comments at 47; USTA UNE Report, Tab 5, at 1-5.

(i) Definition

384. In the *Local Competition First Report and Order*, the Commission defined the signaling network element as including, but not limited to, signaling links and signaling transfer points (STPs).[753] No party commenting in this phase of the proceeding has asked us to modify our definition, and we find no marketplace developments that would cause us to re-evaluate our definition of the signaling network element. Accordingly, we reaffirm the definition of signaling networks that was adopted in the *Local Competition First Report and Order*.[754]

(ii) Proprietary Analysis

385. We agree with commenters that signaling links and STPs are not proprietary.[755] Moreover, we do not discern any copyright, patent, or trade secret implications to unbundling signaling links and STPs, and carriers do not generally rely upon their signaling links and STPs to differentiate themselves from their competitors. In addition, SS7 signaling networks generally adhere to Bellcore standards rather than LEC-specific protocols, and provide seamless connectivity between networks.[756] We therefore conclude that signaling links and STPs are not proprietary elements, and we analyze signaling networks under the "impair" standard of section 251(d)(2)(B).

(iii) Unbundling Analysis

386. Current switch technology requires each local switch to connect to a single STP.[757] All parties, including incumbent LECs, agree that because the incumbent LECs' switching networks are already connected to a STP, a carrier that purchases unbundled switching from an incumbent LEC must also purchase signaling from that incumbent

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[753] *Local Competition First Report and Order*, 11 FCC Rcd at 15724, para. 456.

[754] *Id.* at 15723-24, para. 455.

[755] *See, e.g.*, Allegiance Comments at 19-20; Cox Comments at 34-35; e-spire Joint Comments at 26.

[756] *Local Competition First Report and Order*, 11 FCC Rcd at 15739, para. 481.

[757] BellSouth Comments at 76. *See also* Ameritech Comments at 114 n.326 (citing James H. Green, *The Irwin Handbook of Telecommunications* 297 (3rd Ed. 1997) (" he SS7 network routes messages on a point-to point basis using unique originating and terminating point codes. Each node in the network is identified by its own unique point code/network address. When a call is set up between two end office switches, the originating end office formulates an initial address message (IAM) to the terminating end office. The IAM includes the originating telephone number, originating point code, terminating telephone number, and terminating point code. To route a signaling packet successfully, the STP must associate each point code with a particular end office. Existing technology, therefore, permits routing over only a single set of A-links, (links between a specific end office and the SS7 network), for any given point code.").